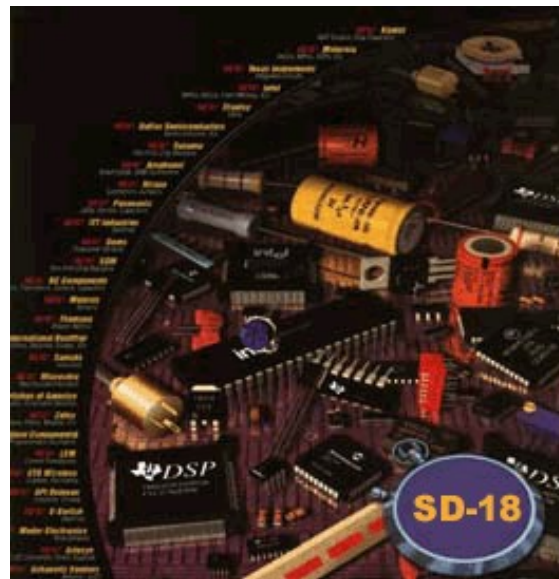


Parts Requirement & Application Guide SD-18



- **Background/Introduction**
- **SD-18 Features**
- **SD-18 Sections**
- **SD-18 Future Tasks**



SD-18 Introduction

- **What is SD-18?**

- Originated as NAVSEA Parts Requirements and Application Manual TE000-AB-GTP-010 Rev 2
- Became DSPO Standardization Document SD-18 on 8/9/2000
- Emphasis on COTS part usage
- Maintained by NAVSEA Crane

- **Why do we need it?**

- Increased use of COTS
- Use of COTS in harsh environments

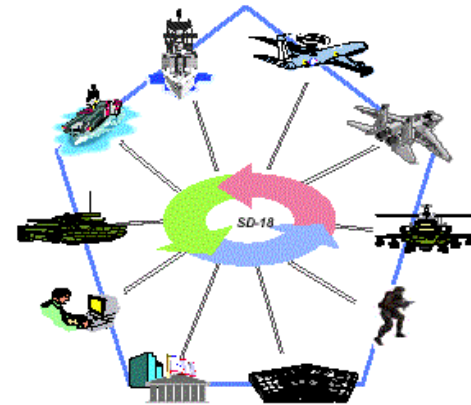
- **How can SD-18 help you?**

- Provide part information & data for application implementation



SD-18 Features

- **Provides design, reliability-risk, and part assessment information**
- **Standardizes on “State of the Practice” not “State of the Art”**
- **“Parts Best Practices” living web site and guide for part applications in military environments**
- **PEM assessment standardized**
- **Paperless document, Web based**
- **Available on CD**
- **Funded by DSPO**



SD-18 Homepage

SD-18 Home - Microsoft Internet Explorer

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Address <http://www.crane.navy.mil/sd18/> Go Links

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SD-18
Part Requirement & Application Guide

Menu

- Home
- Foundation >
- Products >
- Resources >
- Library >
- Order Form
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The Part Requirement and Application Guide is sponsored by the [Defense Standardization Program](#). It provides guidance on how the [Department of Defense](#) (DoD) and its contractors can cooperatively select devices that will result in the lowest cost ownership for the DoD.

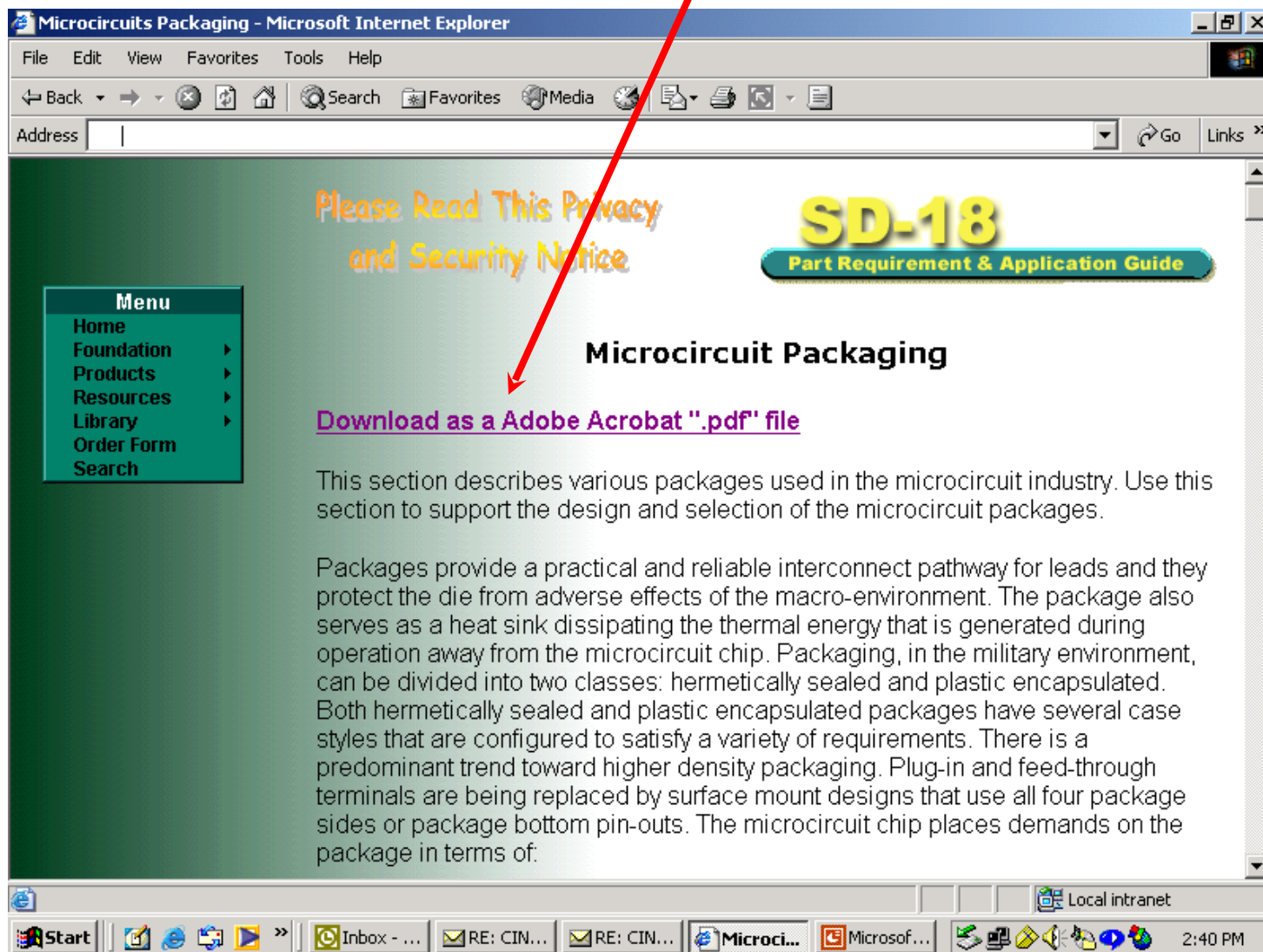
SD-18

Local intranet

Start | WW - ... | Micros... | SD-18... | Gener... | Micros... | SD-1... | 3:40 PM



Printing SD-18



- **Forward**
- **Environmental Categories**
- **Requirements**
- **Part Acceptance**
- **Derating**
- **Upgrading**
- **Part Reliability**

- **Microcircuits**
- **MCM's, Hybrids & SOCs**
- **Optoelectronic Devices**
- **Discrete Semiconductors**
- **Connectors**
- **Resistors**
- **Capacitors**

- **RAD Hard**
- **Electrical Stress Derating Analysis**
- **Electrostatic Discharge Consideration**
- **DMSMS**

- **DoD Reports**
- **Thermal Assessment**
- **Developing Technologies**
- **Product Archives**
- **Test Methods**
- **Lead-Free Solder**
- **Spray Cooling**

Protected Environment

The protected environment is applicable for parts employed according to the following provisions:

- a. used in readily accessible maintenance applications
- b. used in a controlled environment
- c. with a temperature range of 0°C to 70°C
- d. not used in an application with shock, vibration, pressure or moisture
- e. not stored for later usage
- f. with an application life-span of up to 5 years

SD-18 Environmental Categories

Normal Environment

The normal environment is applicable for parts employed according to the following provisions:

- a. used in inhabited applications
- b. used in applications usually accessible for maintenance or replacement
- c. used in an uncontrolled, but not extreme, temperature environment with a temperature range of -40°C to +85°C
- d. used in an application having a minimal to low-medium controlled shock, vibration, pressure or moisture environment
- e. can be stored for later usage (not to exceed 10 years)
- f. with an application life span of 5 to 10 years

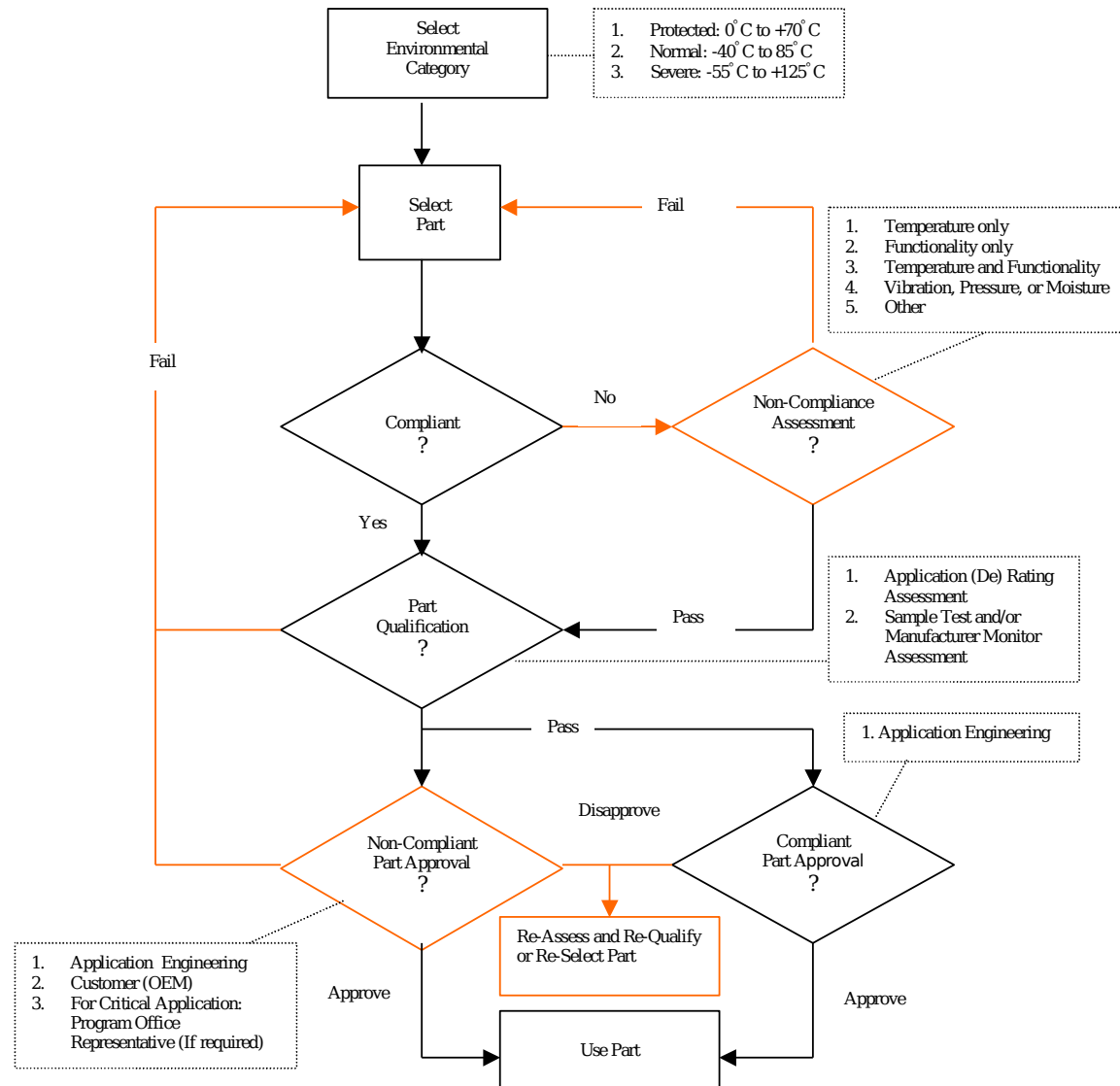


Severe Environment

The severe environment is applicable for parts employed according to the following provisions:

- a. used in uninhabited environments
- b. used at varying temperatures or temperature extremes
- c. with a temperature range of -55°C to 125°C
- d. used in an application having a medium to high shock, pressure, vibration, or moisture environment
- e. can be stored for later usage (over 10 years)
- f. with an application life span of 10 to 20 years

Part Acceptance Flow Chart



Derating

Products: Microcircuits

Digital MOS and Bipolar Microcircuit Derating Requirements

Type		Derating Parameter	Environment		
Digital	Package		Protected	Normal	Severe
MOS	Hermetic	Supply Voltage	/3	/3	/3
		Frequency	90%	90%	90%
		Output Current	90%	85%	80%
		Fanout	100%	90%	90%
		J unction Temperature (T_J)	125° C	110° C	100° C
	Plastic 1/	Supply Voltage	/3	/3	
		Frequency	90%	80%	
		Output Current	90%	80%	
		Fanout	100%	90%	
		J unction Temperature (T_J)	90° C	85° C	
	Plastic 2/	Supply Voltage	/3		
		Frequency	80%		
		Output Current	70%		
		Fanout	80%		
		J unction temperature (T_J)	70° C		

Notes:

- 1/ Plastic packaged microcircuit with heat dissipating mechanisms (e.g. thermal fillers, thermal conductivity plate or a type of metal substrate) built-in.
- 2/ Low-power plastic packaged microcircuits with no heat dissipating mechanism other than through the leads.
- 3/ The supply voltage must be kept within the microcircuit specification sheets minimum and maximum limit.



SD-18 Future Tasks

- **Asking users to review SD-18 sections for needed updates**
- **Solicit technical experts for inputs**
- **G12 & G-11 recommending improvements**
- **COTS part military-application assessments**
- **Add requested data or info in the future**
- **Configuration Management of SD-18 sections**
- **Teaming with Army AMCOM**



SD-18 Future Tasks Army AMCOM

- **PEMs**
 - Update based on latest data (AMCOM test results)
 - Incorporate life cycle environments
- **Circuit Card Assembly**
 - Document management approaches
 - Address life cycle approaches
 - Solder Joint Reliability tools
- **Life Cycle Environment**
 - Incorporate proper requirements into System specs
 - Apply to Design Verification, Qualification

SD-18 Access

- **Web based document**

<http://www.crane.navy.mil/sd18>



- **CD-ROM available from NAVSEA Crane**

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